THURSDAY, FEBRUARY 27, 1896.

THE CATALOGUE OF SCIENTIFIC PAPERS.

Catalogue of Scientific Papers (1874–1883). Compiled by the Royal Society of London. Vol. xi. [Pet—Zyb]. Pp. 902. (London: Clay and Sons, 1896.)

THIS volume marks the completion of the third series of the Royal Society's contribution to the bibliography of science. With it the "Index Auctorum" for the ten years 1874–83 is completed, as originally planned, but in order to make the list of papers as exhaustive as possible, the Society are, as is known, actively preparing a supplementary volume to contain additional titles and references, taken from serials published not only during that decennium, but also of earlier date, which from one cause or another are not included among those at present indexed. When this supplement is issued, as we hope it may be within the next two or three years, we shall be in possession of a practically complete author-index to the whole vast mass of the serial literature of science, back from the year 1883 to the beginning of the nineteenth century.

Such a register, simple and straightforward, but accurately and systematically compiled, must always form an invaluable and indispensable basis on which to elaborate any further schemes of indexing which may attempt to furnish a guide to the contributions to each of the special departments of science. The whole problem, how best to grapple with the task of recording and indexing the ever-increasing mass of scientific literature, is one of the burning questions of the time for all cultivators of science. This problem the Royal Society have been steadily attacking since the middle of the century, when (in 1858) they commenced work upon their great Catalogue.

In our notice of vol. ix., the first of the present series (NATURE, vol. xlv. p. 338, February 1892), we gave a brief summary of the origin and progress of the Royal Society's bibliographical undertaking, and in the same article we referred to the long-canvassed and still unsettled question of a parallel subject-index. To this we will recur further on. Meantime, a short analysis of the contents of the series now completed may furnish some particulars at once instructive and interesting.

The total number of individual papers entered in the 2900 odd pages of these three volumes we estimate to be between 89,000 and 90,000. The number contained in the two volumes for the preceding decennium (1864-73) we make, by a similar estimate, about 70,000. This shows an increase of about 25 per cent., and such may probably be taken as fairly representing the actual amount of increase in scientific activity during the second ten-year period, on the assumption that the two series comprise a like proportion of the total literature of science. The original series, covering the long period 1800–1863, indexed the remarkably high total of 1500 publications. The exact number indexed for the second series (1864–73) is not quite apparent. The number for the present series is 570, a rather unaccountable decrease when compared with the large number just quoted, and undoubtedly too small to furnish a sufficiently exhaustive record of the scientific work of the world. The Society themselves recognise this, and, as we have said, are making provision for the amplification of the Catalogue by indexing some hundreds of additional serials. The greater part of these must doubtless be of minor importance, but there are also a considerable minority of publications of a high order of merit which, as we pointed out in our notice of vol. x. of the Catalogue (NATURE, vol. l. p. 241, July 1894), were unhappily not included in the list the Society originally worked from.

Of those indexed in this third series we count 192 publications bearing English titles, equal to about 33 per cent. of the whole; 116 French, or about 20 per cent.; and 165, or about 29 per cent., German. These numbers may possibly give a fair idea of the actual proportion obtaining between the contributions to the total literature of science as divided among these three languages; but we need not go further, and attempt to draw conclusions from them as to the relative scientific activity of the peoples speaking them.

The proportions in which the various branches of science contribute to the aggregate of serial literature is not very easy to determine. So far as a somewhat rough estimate may suffice, we should say that nearly 40 per cent. of the entries in the list of publications are devoted to general science, about 35 per cent. to biological, and 25 per cent. to physical and mathematical science. The distinction, however, is not always easy, but there seems a decided preponderance of biological over physical literature.

The printing of the three volumes of this series has occupied some six years, and the supplementary volume will, we imagine, not be issued before another two years at least, making a total interval of fifteen years between the date to which the work extends and the date of complete publication. It is easier to deplore these long intervals than to avoid them, especially while one Society endeavours to cope single-handed with the vast and ever-increasing mass of material. In his address at their last anniversary, Lord Kelvin said that "the continuation of such a work was almost beyond the resources of the Royal Society," and referred to the efforts that were being made to secure effectual international co-operation. As a step towards this, the Society have issued invitations to an International Conference to be held in London during the coming summer, at which the whole question of cataloguing and indexing the literature of science may be discussed from an international point of view, and at which it may be hoped the outlines of a scheme may be agreed upon, the details of which could be filled in later on. As a result co-operative work on a comprehensive and well-considered system might be definitively commenced, say, with the turn of the century, starting as from January 1, 1901.

If the same research work is often needlessly done twice or thrice over, it is equally certain the same cataloguing and indexing work is done needlessly many times over when once might have sufficed. To save this waste of time and labour, organised collaboration on a large scale seems the one thing needful, and we see no reason to fear that this cannot be successfully arranged. The desideratum of comprehensive and accurate subject-indexes makes itself more acutely felt with every year

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that passes, and one of the questions of method which calls loudest for settlement is what particular plan should be adopted for the preparation of such indexes. The feeling of bibliographers now leans strongly towards the general adoption of the ingenious system of decimal notation devised by Mr. Melvil Dewey, the director of the New York State library—a numerical system of indicating and distinguishing the divisional sections and sub-sections of a classification to any desired degree of subdivision, the number affixed to an entry distinguishing not only the particular ultimate subdivision of the general subject, but at the same time indicating all the superior divisions to which the work in question also belongs. The merits of this principle of notation are independent of those of the elaborate classification of all literature which Mr. Dewey has laboriously prepared for use with it. The latter may be open to criticism, but it must be remembered that no classification is likely to satisfy every one. Some sacrifices are inevitable, and we believe that, even as it stands, Mr. Dewey's classification is a workable scheme adequate for most practical purposes. Indeed, American experience has tested this point for some years now. Accordingly, the International Conference of Bibliography, which met at Brussels last autumn, recommended the entire adoption of Mr. Dewey's system, which has also been approved and adopted, among others, and not to mention its American supporters, by the Association Française, the International Congress of Zoology, the recently-founded Institut International de Bibliographie (Brussels), and our Paris contemporaries, the *Revue Scientifique* and the *Revue Générale des Sciences*.

Other questions which remain to be settled by general agreement are the mode of preparing the material, the extent to which cognisance should be taken of the contents of papers as well as of their titles, the degree of subdivision to which classification should be carried, the terminology, and the language or languages to be employed. These and other associated questions are all ripe for settlement, and it cannot be said that any of them are beyond the reach of general agreement when all are convinced of the urgent need for their practical solution. Meanwhile schemes are formulating and maturing. M. Otlet, of Brussels, and his collaborators of the Institut de Bibliographie have developed and are applying a comprehensive system. The Faculty of Medicine of Harvard University have appointed a special committee to report on the question of a general bibliography of science. The French Ministry of Public Instruction is publishing a "Bibliographie des Travaux Scientifiques publiés par les Sociétés Savantes de la France."

About the last-mentioned work, an undertaking presenting, on a smaller scale, many points of similarity to that of the Royal Society, we may say a word or two. The idea originated with M. Milne-Edwards, and the work is being carried out by Dr. Deniker, the librarian of the Muséum d'Histoire Naturelle. It covers the long period from 1700 to 1888, and is to be divided into three sections. The first section, which is now going through the press, is an enumeration, volume by volume, of all the scientific articles contained in every serial, the serials being taken in alphabetical order of departments, and of the towns in each department, in which the societies are domiciled. The second section is to be the general "Index Auctorum," each title bearing as reference the *numéro d'ordre* prefixed to it in the first section; and the third section is to be the "Index Rerum," each entry again bearing its reference number as before. This plan may be open to criticism, but the bibliography will be a fine piece of work when completed, and, as we said, to some extent parallel to the Royal Society's Catalogue, and indeed duplicating a large fraction of its contents. While admiring the industry and enthusiasm of its compiler, we are bound to feel some degree of regret when skill, labour and time are thus expended upon isolated sporadic and unco-ordinated undertakings, while they might be far more efficiently employed in co-operating upon one well-considered and carefully organised international scheme. This is the direction which future indexing work must inevitably take, and we look forward with impatience to the realisation of this crowning development of the Royal Society's long-sustained labours.

NATURAL SELECTION AND ITS CRITICS.

Nature v. *Natural Selection. An Essay on Organic Evolution.* By Charles Clement Coe. Pp. 591. (London: Swan Sonnenschein and Co., 1895.)

THE author at the outset of this work tells us he "believes that the process of organic evolution has taken place, but he does not believe that natural selection has been the means by which that result has been brought about." The object of his work is the attempt to support the latter contention. He does not profess to speak as an expert, or to bring forward any new observations, but chiefly occupies himself with the quotation and criticism of isolated passages from previous writers. He evidently feels a very sincere disbelief in the adequacy of natural selection, and regards himself as compelled by some sort of inspiration to communicate this disbelief to the world.

It is evident that the criticisms are intended to be fair, and they are conceived in no unfriendly spirit, and expressed with no want of respect to the great writers on the subject; but the method of minute verbal criticism of single sentences and short passages is one which almost invariably leads to unfairness, however unintentional, and the work before us has certainly not escaped from this very natural tendency.

A few instances, upon all of which comment is superfluous, will sufficiently indicate the competence of the author to deal with his subject, and the spirit in which he approaches it.

In speaking (p. 23) of the two phrases (he unaccountably calls them "two contradictory theories"), "Natural Selection" and "Survival of the Fittest," he says: "It seems almost incredible that a great writer should have rejected the more accurate in favour of the sometimes more convenient phrase." He seems to forget that it was too late to withdraw a phrase which was already world-wide, and, furthermore, that convenience in such matters is of very high importance. As the author inquires why natural selection is more convenient, he may be referred to Darwin's "Life and Letters," in which the subject is

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